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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,535

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EXAMINER

GOODWIN, DAVID J

ART UNIT

PAPER NUMBER

2818

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,535	<b>Applicant(s)</b> TAKAYAMA ET AL.	
	<b>Examiner</b> DAVID GOODWIN	<b>Art Unit</b> 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-9 and 14-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9, 14-28 and 66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
2. Claim 19 depends on canceled claim 4 and is therefore unclear.
3. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 22 depends on canceled claim 4 and is therefore unclear.
5. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claim 23 depends on canceled claim 5 and is therefore unclear.
7. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Claim 26 depends on canceled claim 4 and is therefore unclear.
9. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. Claim 27 depends on canceled claim 5 and is therefore unclear.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 3, 7, 8, 9, and 17 through 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama (US 6107685).

3. Regarding claim 1.

4. Nishiyama teaches an electronic component. Said component comprises A plurality of circuit elements (39) on one surface of a substrate (33), the circuit elements being resistive (fig 5). A plurality of electrode pairs (38) on the one surface of the substrate the electrode pairs being respectively connected to circuit elements (fig 5). A plurality of lands (38) include first lands and second lands, the second lands have a larger area than the first lands (fig 5). The circuit elements connected to the electrode pairs with the second lands are offset such that the circuit elements are laterally displaced from the shortest path between a center of each electrode of the electrode pairs in a plan view (fig 5) (column 6 lines 1-40).

5. Note: Referring to figure 5, a plurality of lands (38) is shown. Any two of said lands (39) is a pair of lands. Said pair of lands is connected to circuit elements (39). Said circuit elements are displaced from the shortest path between the lands, said shortest path being the straight line path intersecting the center of a given electrode pair.

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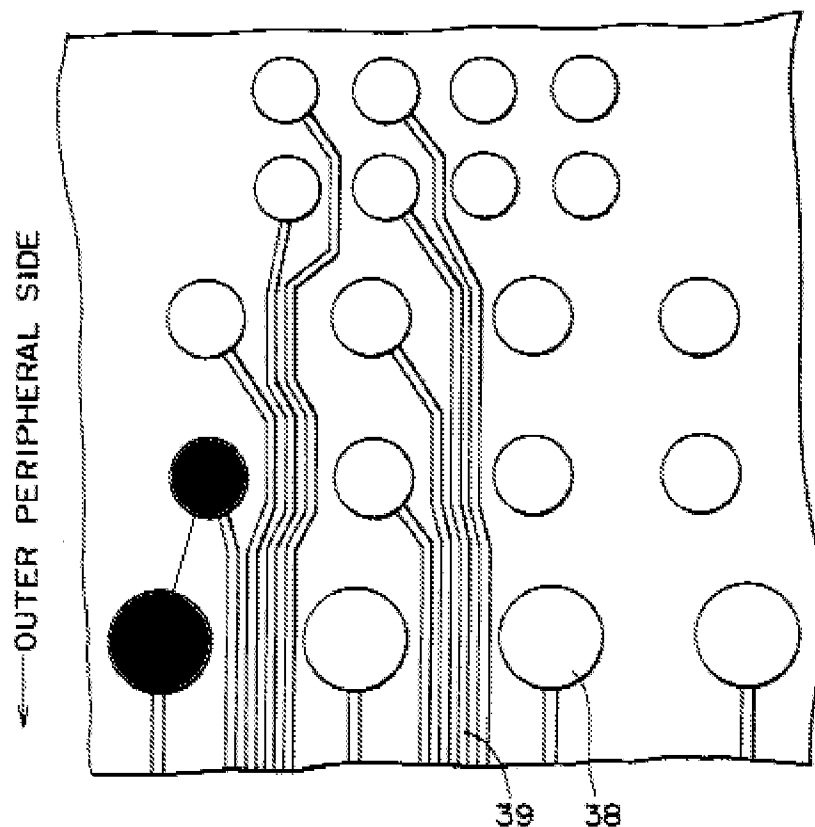
6. Nishiyama does not teach in this embodiment the structure of the solder balls.

7. Nishiyama teaches in another embodiment an overcoat (13) covering circuit elements and electrodes (6a) while partially exposing part of each electrode of the exposed part providing a plurality of lands. A plurality of conductive balls (6) respectively fixedly bonded to the lands by fixedly bonded members (fig 6d). The conductive balls are substantially equal in size to one another (column 2 lines 20-60).

8. It would have been obvious to one of ordinary skill in the art to use the solder balls to connect to the lands in order that the circuit elements can be connected to the circuitry of another substrate.

9.

FIG. 5



10.

11. Note the pair of blackened electrodes above having a first land and a second land (fig 5). Said pair of electrodes are connected to circuit elements. Said circuit elements connected to the pair of electrodes, having the first and second lands, are laterally displaced from the shortest path connecting the center of electrode of the electrode pair (shown above).

12. Regarding claim 2.

13. Nishiyama teaches that each of the second lands is located at a position proximate to an external end of the substrate (fig 2a, 3d, 5).

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14. Regarding claim 3.

15. Nishiyama teaches that the fixedly bonding member at each land has a size that is proportional to an area of each land so that the conductive balls are fixedly bonded to an entire surface of each land (fig 6d).

16. Regarding claim 7

17. Nishiyama teaches the substrate is a tetragon and one of the second lands is located in each corner of the tetragon substrate (fig 1a).

18. Regarding claim 8.

19. Nishiyama teaches that the substrate is a tetragon and one of the second lands is located at a position proximate to each of both external ends of the tetragonal substrate in a direction of a shorter side of the tetragonal substrate (fig 1a).

20. Regarding claim 9.

21. Nishiyama teaches the second lands are shaped as at least an ellipse (fig 1a, 2a, 5).

22. Regarding claim 17.

23. Nishiyama teaches the substrate is a tetragon and one of the second lands is located in each corner of the tetragon substrate (fig 1a).

24. Regarding claim 18.

25. Nishiyama teaches the substrate is a tetragon and one of the second lands is located in each corner of the tetragon substrate (fig 1a).

26. Regarding claim 19.

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27. Nishiyama teaches the substrate is a tetragon and one of the second lands is located in each corner of the tetragon substrate (fig 1a).

28. Regarding claim 20.

29. Nishiyama teaches that the substrate is a tetragon and one of the second lands is located at a position proximate to each of both external ends of the tetragonal substrate in a direction of a shorter side of the tetragonal substrate (fig 1a).

30. Regarding claim 21.

31. Nishiyama teaches that the substrate is a tetragon and one of the second lands is located at a position proximate to each of both external ends of the tetragonal substrate in a direction of a shorter side of the tetragonal substrate (fig 1a).

32. Regarding claim 22.

33. Nishiyama teaches that the substrate is a tetragon and one of the second lands is located at a position proximate to each of both external ends of the tetragonal substrate in a direction of a shorter side of the tetragonal substrate (fig 1a).

34. Regarding claim 23

35. Nishiyama teaches that the substrate is a tetragon and one of the second lands is located at a position proximate to each of both external ends of the tetragonal substrate in a direction of a shorter side of the tetragonal substrate (fig 1a).

36. Regarding claim 24.

37. Nishiyama teaches the second lands are shaped as at least an ellipse (fig 1a, 2a, 5).

38. Regarding claim 25.



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39. Nishiyama teaches the second lands are shaped as at least an ellipse (fig 1a, 2a, 5).

40. Regarding claim 26.

41. Nishiyama teaches the second lands are shaped as at least an ellipse (fig 1a, 2a, 5).

42. Regarding claim 27.

43. Nishiyama teaches the second lands are shaped as at least an ellipse (fig 1a, 2a, 5).

44. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama (US 6107685) as applied to claim 1 and further in view of Zeng (US 7070088).

45. Regarding claim 14

46. Nishiyama teaches elements of the claimed invention above.

47. Nishiyama does not teach the incorporation of a silver lead paste.

48. Zeng teaches forming a layer of paste (707) comprising silver and lead on the landing pad (706) (fig 7) (column 5 lines 25-45).

49. It would have been obvious to one of ordinary skill in the art to incorporate a silver lead containing paste in order to improve fatigue resistance.

50. Claims 6 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama (US 6107685) as applied to claim 1 and further in view of Huang (US 5172471).

51. Regarding claim 6

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52. Nishiyama teaches elements of the claimed invention above.

53. Nishiyama does not teach that the lands are larger in one direction than another.

54. Huang teaches lands (122) that are larger in the direction of the longer side of the substrate than in the direction of the shorter side of the substrate (112) (fig 5) (column 7 lines 40-60).

55. It would have been obvious to one of ordinary skill in the art to form lands that are larger in one direction in order to increase the contact area between the lead and the land and thereby reduce surface resistance misalignment problems.

56. Regarding claim 28.

57. Nishiyama teaches the second lands are shaped as at least an ellipse (fig 1a, 2a, 5).

58. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama (US 6107685) as applied to claim 2 and further in view of Huang (US 5172471).

59. Regarding claim 15

60. Nishiyama teaches elements of the claimed invention above.

61. Nishiyama does not teach that the lands are larger in one direction than another.

62. Huang teaches lands (122) that are larger in the direction of the longer side of the substrate than in the direction of the shorter side of the substrate (112) (fig 5) (column 7 lines 40-60).

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63. It would have been obvious to one of ordinary skill in the art to form lands that are larger in one direction in order to increase the contact area between the lead and the land and thereby reduce surface resistance misalignment problems.

64. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama (US 6107685) as applied to claim 3 and further in view of Huang (US 5172471).

65. Regarding claim 16

66. Nishiyama teaches elements of the claimed invention above.

67. Nishiyama does not teach that the lands are larger in one direction than another.

68. Huang teaches lands (122) that are larger in the direction of the longer side of the substrate than in the direction of the shorter side of the substrate (112) (fig 5) (column 7 lines 40-60).

69. It would have been obvious to one of ordinary skill in the art to form lands that are larger in one direction in order to increase the contact area between the lead and the land and thereby reduce surface resistance misalignment problems.

### ***Response to Arguments***

70. Applicant's arguments with respect to claims 1 through 29 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

71. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID GOODWIN whose telephone number is (571)272-8451. The examiner can normally be reached on Monday through Friday, 9:00am through 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571)272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Djg

/STEVEN LOKE/  
Supervisory Patent Examiner, Art Unit 2818